Space Weather Forecast

Issued on Wednesday, 24 May 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1/R2 radio blackouts. Slight chance of Minor Geomagnetic Storms , especially on 26 or 27 May.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with two Moderate-class flares from the large and complex region in the centre-north of the disc. The second of these occurred during 24 May and may have produced a CME, which will be analysed once sufficient imagery becomes available. The other large region is in the southwest quadrant, but appears to be stable. The remaining regions are all generally small, but a region in the southeast quadrant appears to be growing rapidly and will be monitored. A large CME observed on coronagraph imagery appears to be from a farsided eruption and therefore does not have an Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar winds are elevated due to a fast wind from a coronal hole. Total magnetic field strength has been weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet with one Active interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low to Moderate, with a chance of further M-class flares. The main risk is from AR3311 near north centre disc.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs expected, although a weak CME may give some glancing influence later on 26 May or early on 27 May, although the CME is more likely to miss the Earth. Solar winds are currently at elevated levels, likely due to the high speed stream from coronal hole 06. This is a persistent feature from last rotation, and a further increase in wind speed, perhaps up to 650-700 km/s is possible given the wind strength last rotation. Wind speeds are expected to gradually ease through 26 and 27 May, although this decrease may be inhibited by the possible CME. Geomagnetic activity will be mainly Unsettled to Active at first due to the high speed stream influence, with a slight chance of G1/Minor Storm intervals. Activity easing from the high speed stream through the period, but there is a slight chance of G1/Minor Storms on 26 or 27 May should any glancing CME influence occur.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms occurring. There is just a slight chance of count rates increasing towards the minor storm threshold, should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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